

Prevalence of Insomnia and Its Associated Factors among Family Medicine Residents at Joint Program in Makkah Al Mukarramah and Jeddah Cities

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ABSTRACT

Background: Difficulty in sleeping under stressor due to various living style needs appears to be a great risk factor for physical and mental health status. Family medicine residents are a population that appears to be at increased risk for sleep deprivation due to demanding academic and clinical duties.

Objectives: To estimate the prevalence of insomnia and determine its associated factors among family medicine residents at joint program of family and community medicine in Makkah Al Mukarramah and Jeddah, 2012.

Subjects and Methods: A cross-sectional analytical study was adopted. All family medicine residents in Makkah Al Mukarramah and Jeddah were invited to participate in the study. A validated questionnaire was used based on Pittsburgh Sleep Quality Index (PSQI) and Pittsburg Insomnia Symptoms questionnaire. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month.

Results: The study included 105 family medicine residents out of 119 invited to participate in the study, giving a response rate of 88.2%. Their age ranged between 24 and 39 years with a mean of 28.3 years and standard deviation of 2.4 years. Males represent 51.4% of them. Most of them (77.1%) were poor sleepers during the past month, based on Global PSQI Score. sleep complaints were reported by 74.3% of the participants. Of them, 18.1% suffered frequently or always from difficulty falling asleep. Difficulty staying asleep and frequent awakening

from sleep were reported as frequent or always complaints by 11.5% and 18.2% of them, respectively. Felling that sleep is not sound and it is unrefreshing were mentioned frequently or always by 16.2% and 25.7% of them, respectively. Sleep complaints had extreme impact on concentration and caused extreme sleepy feeling during the day among 6.4% of family medicine residents.

Conclusion: Poor sleep quality is a common problem affecting most of family medicine residents in Jeddah and Makkah Al-Mukarramah. Sleep complaints have consequences on resident work, social and other important parts of life. They are significantly associated with irritability, sleepy during the day and fatigue feelings as well as trouble in concentration.

Keywords: Insomnia, Sleep Quality, Family Medicine, Residents, Prevalence, Associated Factors.

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INTRODUCTION

Insomnia is defined as repeated difficulty with the initiation, duration, maintenance, or quality of sleep that occurs despite adequate time and opportunity for sleep and results in some form of daytime impairment.¹

Approximately one third of adults report some difficulty falling asleep and/or staying asleep during the past 12 months, with 17% reporting this problem as a significant one. As many as 95% of Americans have reported an episode of insomnia at some point during their lives.²

The 2008 update to the American Academy of Sleep Medicine (AASM) guideline for the evaluation and management of chronic insomnia calls insomnia an important public health issue.³ Difficulty in sleeping under stressor due to various living style needs appears to be a great risk factor for physical and mental health status, At first glance; low sleep may result in over activity and increase productivity, but in long term lack of sufficient sleep may lead to psychological distress and low productivity.⁴ Study recruiting healthy samples revealed that even low levels of

sleepiness have an adverse influence on general health.⁵ Studies have demonstrated that poor sleep quality, sleep disruption and change in regular Sleep-wake pattern may cause physical and psychological burden such as impairment in job performance, decreased work efficiency and learning disability.⁶⁻¹¹ For example, Partinen et al reported an association between Inadequate sleep and cardiovascular disease and mortality.^{12,13}

Family medicine residents is a populations that appears to be at increased risk for sleep deprivation due to demanding academic and clinical duties which in coexistent with change in living style such as poor accommodation, being away from family put them at greater risk of poor sleeping and its subsequent mental and physical morbidity. A long prospective study at the John Hopkins University showed that insomnia during medical school is indicative of a subsequent depression and other psychiatric distress persisting at least for 30 years.¹⁴

Considering the probability of remarkable change in a wake pattern of family resident under academic and clinical stress motivated me to conduct this study with the aim to survey the quality of sleep and its associated factors.

This study aimed to estimate the prevalence of insomnia and identify its associated factors among family medicine resident at joint program of family and community medicine in Makkah Al Mukarramah and Jeddah, Saudi Arabia.

SUBJECTS AND METHODS

A cross-sectional analytical study was carried out among all family medicine residents in Makkah Al Mukarramah and Jeddah working during September, 2012 (n=119). Makkah Al Mukarramah is the holiest city on earth to Muslims. It's population in 2008 was 1.8 million, although visitors more than double of this number come every year during Hajj period held in the twelfth Muslim month of Dhu al-Hijjah. Jeddah is the largest city in Makkah Al Mukarramah Province, the largest sea port on the Red Sea, and the second largest city in Saudi Arabia after the capital city, Riyadh. The population of the city currently stands at 3.6 million. It is an important commercial city in Saudi Arabia. Health care is provided by the Saudi government free of charge to all pilgrims. There are also many walk-in clinics available for both residents and pilgrims. In Jeddah and Makkah Al Mukarramah there are around 70 primary health care centers .The study was conducted in Joint Program of Family and Community Medicine,

Makkah Al Mukarramah and Jeddah cities included family medicine residents under training at all level of residency. A validated questionnaire was used based on Pittsburgh Sleep Quality Index (PSQI) and Pittsburg Insomnia Symptoms questionnaire.

The study questionnaire is composed of:

Demographic and personal characteristic of family medicine residents: age, gender, level of residency, residency location, marital status, smoking status, taking sedatives or stimulant medications, past medical history and past psychiatric disorders. PSQI: This measures the quality and patterns of sleep. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. Scoring of answers is based on a 0 to 3 scale, whereby 3 reflect the negative extreme on the Likert Scale. A global sum of "5" or greater indicates a "poor" sleeper. Reliability and validity of PSQI produced a sensitivity of 89.6% and a specificity of 86.5% of patients versus control subjects. This cutoff score correctly identified 84% of patients with disorders of initiating or maintaining sleep, 89% of patients with disorders of excessive sleepiness, and 97% of depressed patients.^{15,16}

Approval of Joint Program of Family and community Medicine Makkah Al Mukarramah was obtained. Participation was considered consent.

The Statistical Package for Social Sciences (SPSS version 19.0) was used for data entry and analysis. Descriptive statistics were computed in the form of frequency and percentage for categorical data and in the form of measures of central tendency (mean, median and mean rank) and measures of dispersion (standard deviation "SD" and interquartile range "IQR") for continuous variables. Regarding analytic statistics, chi-square test was utilized to test for the association and/or difference between categorical variables. Since the PSQI score was abnormally distributed (significant Kolomongrove-Smironove test), non-parametric statistical tests were applied to test for the difference between score of PSQI in different groups. Mann Whitney statistical test was used for comparison of two groups while Kruskal-Wallis test was applied for comparison of more than two groups. Differences were considered as statistically significant when the p-value is less than 0.05.

Table 1: Baseline characteristics of family medicine residents (n=105).

| | | Frequency | Percent |
|---------------------------|-----------------|-----------|---------|
| Age (years) | <30 | 76 | 72.4 |
| | ≥30 | 29 | 27.6 |
| Range | | 24-39 | |
| Mean±SD | | 28.3±2.4 | |
| Gender | Male | 54 | 51.4 |
| | Female | 51 | 48.6 |
| Level of residency | R1 | 27 | 25.7 |
| | R2 | 22 | 21.0 |
| | R3 | 32 | 30.5 |
| | R4 | 24 | 22.8 |
| Marital status | Single | 32 | 30.5 |
| | Married | 72 | 68.6 |
| | Divorced | 1 | 0.9 |
| Residence location | Jeddah | 55 | 52.4 |
| | Makkah | 50 | 47.6 |

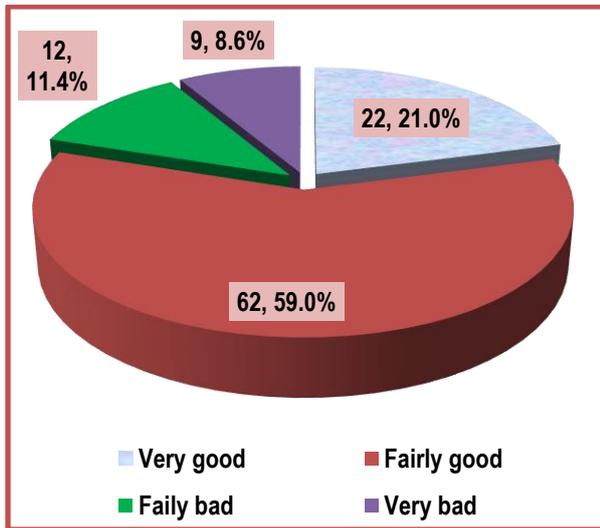


Figure 1: Sleep quality during the past month among family medicine residents.

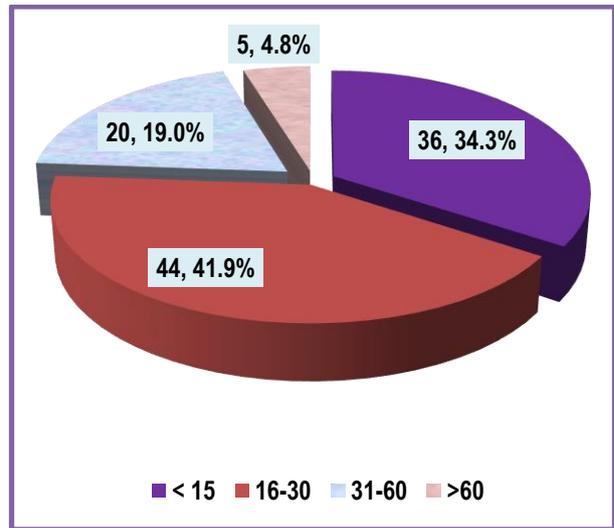


Figure 2: Sleep latency in minutes during the past month among family medicine residents

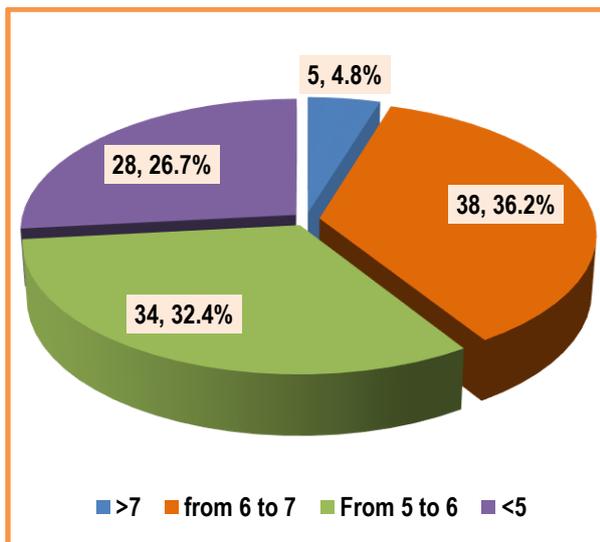


Figure 3: Sleep duration in hours during the past month among family medicine residents.

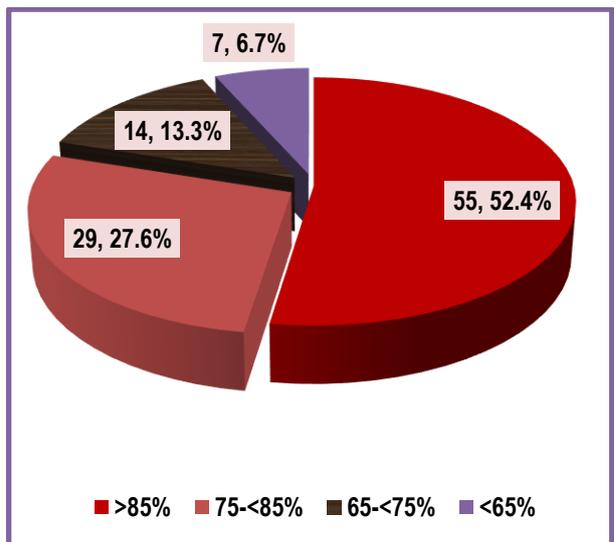


Figure 4: Habitual sleep efficiency during the past month among family medicine residents.

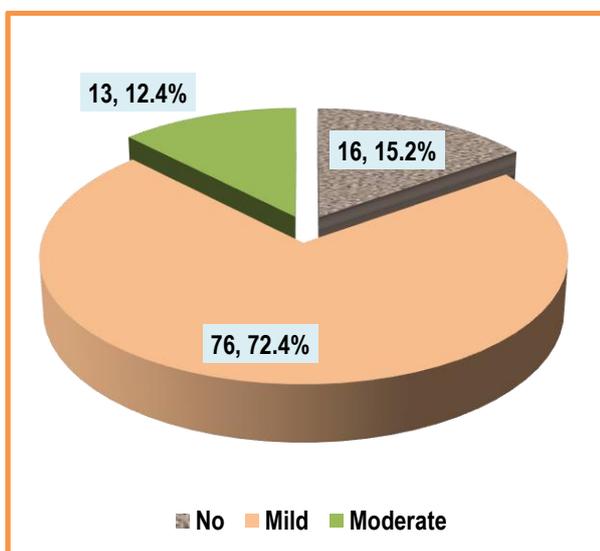


Figure 5: Sleep disturbance during the past month among family medicine residents.

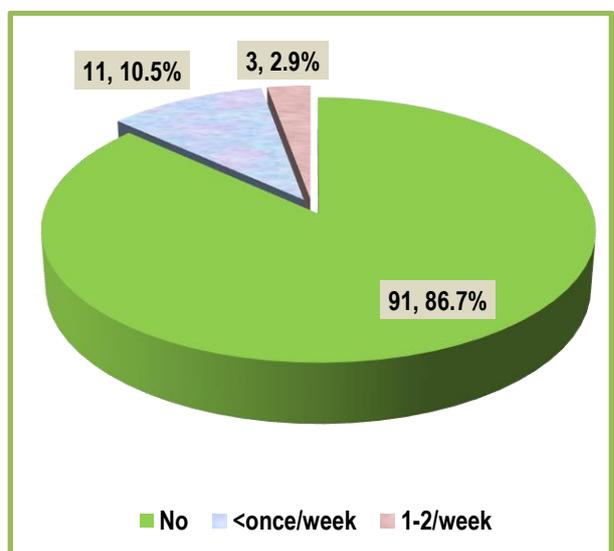


Figure 6: Use of sleep medication during the past month among family medicine residents.

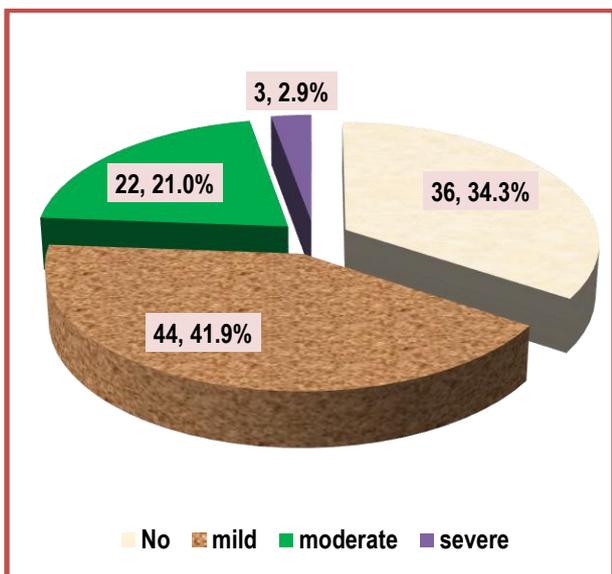


Figure 7: Daytime dysfunction during the past month among family medicine residents.

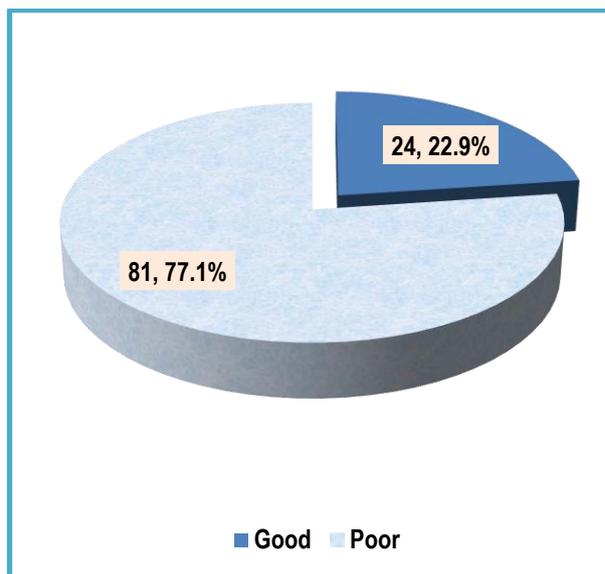


Figure 8: Overall sleep quality based on Global PSQI Score during the past month among family medicine residents.

RESULTS

The study included 105 family medicine residents out of 119 invited to participate in the study, giving a response rate of 88.2%. Table (1) presents the baseline characteristics of the participated residents. Their age ranged between 24 and 39 years with a mean of 28.3 years and standard deviation of 2.4 years. Males represent 51.4% of them. Slightly more than two-thirds of them were married (68.6%). They were almost equally distributed between four residency levels. More than half of them (52.4%) were from Jeddah family medicine program and 47.6% from Makkah family medicine program.

Smoking history was reported by 16.2% of the residents as illustrated in figure 1. Six family medicine residents (5.7%) reported history of taking any sedative or stimulant medications. Almost one-third of family medicine residents (30.5%) had a history of chronic diseases.

As obvious from figure 1, 59% of family medicine residents described their sleep quality during the past month as fairly good while 11.4% and 8.6% described it as fairly bad and very bad, respectively. As shown in figure 2, sleep latency ranged between 16 and 30 minutes among 41.9% of family medicine residents while it was more than one hour among 4.8% of them. Figure 3 shows that almost one-quarter of family medicine residents (26.7%) reported sleep duration of less than 5 hours and almost one-third of them (32.4%) reported sleep duration ranged between 5 and 6 years. As illustrated in figure 4, habitual sleep efficiency was less than 65% among 6.7% of family medicine residents while it was more than 85% among more than half of them (52.4%). It is demonstrated in figure 5 that most of family medicine residents (72.4%) reported mild sleep disturbances and 12.4% reported moderate sleep disturbances while none of them reported severe sleep disturbances. Sixteen family medicine residents (15.2%) did not report any sleep disturbances during the past month. It is obvious from figure 6 that most of family medicine residents (86.7%) reported no use of sleep medications while 1.5% and

2.9% of them reported usage of sleep medications in a dose of less than once per week and once or twice weekly, respectively. As displayed from figure 7, almost one-third of family medicine residents (34.3%) had no daytime dysfunction while 41.9%, 21% and 2.9% of them reported mild, moderate and severe daytime dysfunction, respectively. As shown in figure 8, most of family medicine residents in Jeddah and Makkah Al-Mukarramah (77.1%) were poor sleepers during the past month, based on Global PSQI Score.

Table 2 shows that none of the studied factors (age, gender, residency level, residency location, marital status, history of taking sedative or stimulant medications, history of smoking and history of chronic diseases) were significantly associated with overall sleep quality.

Sleep complaints were reported by 74.3% of family medicine residents in Jeddah and Makkah Al-Mukarramah. Table 3 shows that among those who reported sleep complaints, 18.1% suffered frequently or always from difficulty falling asleep. Difficulty staying asleep and frequent awakening from sleep were reported as frequent or always complaints by 11.5% and 18.2% of them, respectively. Feeling that sleep is not sound and it is unrefreshing was mentioned frequently or always by 16.2% and 25.7% of family medicine residents who reported sleep complaints, respectively.

Impact of Sleep Complaints on Daily Life

Sleep complaints had extreme bothering effect and impact on work of 9.0% of family medicine residents who reported sleep complaints while they had extreme effect on social life and other important parts of life of only 2.6% of them. They had extreme impact on concentration and caused sleepy feeling during the day among 6.4% of family medicine residents who reported sleep complaints.

Nine family medicine residents of those reported sleep complaints (11.5%) reported extreme fatigue and eight of them (10.3%) reported extreme irritability.

Table 2: Factors associated with overall sleep quality in the past month among family medicine residents.

| | | Overall sleep quality | | X ² |
|--|----------------|-----------------------|--------------|----------------|
| | | Good N=24 | Poor N=81 | |
| Age (years) | <30 (n=76) | 18 (23.7) | 58 (76.3) | 0.482 |
| | ≥30 (n=29) | 6 (20.7) | 23 (79.3) | |
| Gender | Male (n=54) | 13 (24.1) | 41 (75.9) | 0.471 |
| | Female (n=51) | 11 (21.6) | 40 (78.4) | |
| Level of residency | R1 (n=27) | 7 (25.9) | 20 (74.1) | 0.578 |
| | R2 (n=22) | 7 (31.8) | 15 (68.2) | |
| | R3 (n=32) | 6 (18.8) | 26 (81.3) | |
| | R4 (n=24) | 4 (16.7) | 20 (83.3) | |
| Marital status | Single (n=32) | 6 (18.8) | 26 (81.2) | 0.581 |
| | Married (n=72) | 17 (23.6) | 55 (76.4) | |
| Residence location | Jeddah (n=50) | 9 (16.4) | 46 (83.6) | 0.076 |
| | Makkah (n=55) | 15 (30.0) | 35 (70.0) | |
| Smoking | Yes (n=17) | 5 (29.4) | 12 (70.6) | 0.337 |
| | No (n=88) | 19 (21.6) | 69 (78.4) | |
| Taking sedative or stimulant medications | Yes (n=6) | 1 (16.7) | 5 (83.3) | 0.584 |
| | No (n=99) | 23 (23.2) | 76 (76.8) | |
| History of chronic diseases | Yes (n=32) | 7 (21.9) | 25 (78.1) | 0.544 |
| | No (n=73) | 17 (23.3) | 56 (76.7) | |

Table 3: Sleep complaints among family medicine residents.

| | Never/ do not know N (%) | Rarely N (%) | Sometimes N (%) | Frequently N (%) | Always N (%) |
|------------------------------------|--------------------------------|-----------------|--------------------|---------------------|-----------------|
| Difficulty falling asleep | 44 (41.9) | 29 (27.6) | 13 (12.4) | 11 (10.5) | 8 (7.6) |
| Difficulty staying asleep | 40 (47.6) | 26 (24.7) | 17 (16.2) | 9 (8.6) | 3 (2.9) |
| Frequent awakening from sleep | 49 (46.6) | 23 (21.9) | 14 (13.3) | 9 (8.7) | 10 (9.5) |
| Felling that sleep is not sound | 54 (51.4) | 14 (13.3) | 20 (19.1) | 12 (11.4) | 5 (4.8) |
| Felling that sleep is unrefreshing | 35 (33.3) | 20 (19.0) | 23 (22.0) | 21 (20.0) | 6 (5.7) |

Table 4: Affection of daily life by sleep complaints among family medicine residents

| | Not at all N (%) | A little bit N (%) | Moderately N (%) | Quite a bit N (%) | Extremely N (%) |
|---|---------------------|-----------------------|---------------------|----------------------|--------------------|
| Botheing effect | 10 (12.8) | 34 (43.6) | 20 (25.6) | 7 (9.0) | 7 (9.0) |
| Impact on Work | 16 (20.5) | 27 (34.6) | 22 (28.2) | 6 (7.7) | 7 (9.0) |
| Impact on social life | 21 (26.9) | 31 (39.7) | 13 (16.7) | 11 (14.1) | 2 (2.6) |
| Impact on other important parts of life | 25 (32.1) | 24 (30.8) | 23 (29.5) | 4 (5.1) | 2 (2.6) |
| Irritability feeling | 19 (24.4) | 26 (33.3) | 13 (16.7) | 12 (15.4) | 8 (10.3) |
| Trouble in concentration | 10 (12.8) | 32 (41.0) | 19 (24.4) | 12 (15.4) | 5 (6.4) |
| Feeling fatigue | 5 (6.4) | 31 (39.7) | 20 (25.6) | 13 (16.7) | 9 (11.5) |
| Sleepy feeling during the day | 8 (10.3) | 33 (42.3) | 26 (33.3) | 6 (7.7) | 5 (6.4) |

DISCUSSION

In the present study, almost 77% of the family medicine residents reported poor sleep quality. There may be several explanations for this poor sleep quality among them. It has been hypothesized that newly graduated physicians have difficulties unwinding after working hours.¹⁷ In addition, it has been found that individuals with insomnia tend to think excessively about their sleep and the consequences for the next day if they do not get enough sleep.^{18,19} This represents a hyperactive state, which may involve increased activation of the hypothalamic–pituitary–adrenal (HPA)

axis, resulting in a chronic allostatic load.²⁰ In this regard, Melamed et al.²¹ suggested that the link between burnout documented among newly graduated physicians and sleep disturbances may be mediated by a disturbance of the HPA axis, which is considered the central stress–physiological system for an organism's long-term adaptation to stress.²² Other researches showed similar results.^{23,24}

In a study involving 149 residents from 5 US academic medical centers and 6 different specialties, multiple adverse effects of

sleep loss on the ability to learn or think, cognitive function, attention, professionalism, and task performances were described.²⁵ Residents felt a lack of motivations to learn, as well as an impairment in their short- and long- term acquisition of knowledge and high- order thinking skills pertaining to medical decision making. The subjects also admitted to feeling moderately sleepy during teaching grand rounds. Most residents expressed frequent concerns about errors in patient's care, such as misdiagnoses, not entering relevant information in the patient's record, writing prescriptions with incorrect dosages, or prescribing medications to the wrong patient. In the present study, sleep complaints had extreme bothering effect and impact on work of 9.0% of family medicine residents who reported sleep complaints. They had extreme impact on concentration and caused sleepy feeling during the day among 6.4% of family medicine residents who reported sleep complaints. Extreme fatigue and irritability were reported by more than 10% of family medicine residents who had sleep complaints.

Shift work, which is common in the medical field, poses health risks and concerns for physicians in training and practicing physicians. Various studies have shown an increased mortality rates, as well as other negative health consequences associated with shift work and sleep deprivation.²⁶

In a recent survey of emergency medicine residents, 89% reported use of caffeine during their night shifts, with more than half of them using it an every night shifts. Thirty-eight percent reported using sedatives to fall asleep after their night shift.²⁷ Other studies^{28,29} demonstrated the negative effects of sleep deprivation coupled with circadian-process changes associated with work shift. A study included only first year residents showed that cognitive skills were more affected than psychomotor skills.²⁶ In the present study, family medicine residents at levels 1 and 2 had night shifts and this could explain the higher score of daytime sleeping among residents of first level than other residency levels. In addition, only 6% of family medicine residents reported using of sedative or stimulant medications.

The existing literature that largely assesses the effects of sleep deprivation among physicians in training is methodologically limited, as most are survey studies that are prone to recall bias. It is difficult to ascertain the degree to which the adverse effects and impairments are attributable to sleep loss or scheduling factors resulting in residents having to work during their natural sleep time. Although there is some conflicting evidence as to whether actual sleep deprivation or circadian process disturbances are responsible for the commission of medical errors, overall the data suggest that there is a deteriorious effect of long work hours and shift-work on numerous resident-and patient-related outcomes.^{25,28-30} In accordance with these studies, in the present work, most of family medicine residents who had sleep complaints reported fatigue, irritability and trouble concentration, regardless their frequency.

Papp, et al reported in their study that most residents felt that sleep complaints adversely affected their physical and psychological health and mood. Papp In addition, they perceived lack of time for activities of daily living and leisure. They described difficulties in starting or maintaining relationship and being effective parents during their training period. Also, in their survey, residents reported being more irritable with their children and feeling guilty about not spending enough time with them.²⁵ In

accordance with these findings, the present study revealed that almost two-thirds of family medicine residents who had sleep complaints reported adverse impact on their social and other important parts of life.

The present research has its strengths and limitations. The most notable strength is that the study population constituted all family medicine residents in Heddah and Makkah Al-Mukarramah. In addition, the participation rate (88.2%) of the present study is quite high, given that values in surveys among physicians are around 50%^{31,32} or even lower.³³ This suggests that selection bias in the study is limited, and that we may generalize our conclusions. In contrast, an important limitation is the cross-sectional design of the study, which precludes evaluation of the temporality and causality of the observed relationships. Another limitation is that data were collected by means of self-reports. However, empirical research has indicated that self-report measures of insomnia are highly correlated with objective measures such as polysomnography or actigraphy.³⁴

In conclusion, Poor sleep quality is a common problem affecting most of family medicine residents in Jeddah and Makkah Al-Mukarramah with no difference between them regarding age, sex, level and location of residency, marital status, smoking history, taking sedatives or stimulant medications and history of chronic diseases. The finding of the present study encourages the need for early diagnosis and treatment of sleep disorders among family medicine residents. Even if shifts lead to circadian rhythm disruption and accidents, medical administrators will have to determine their priorities: the staffing requirements of hospitals may limit the potential for altering hospital schedules to improve the health of residents and their safety.

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